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**(Reaffirmed 2000)**

**Edition 1.1**

**(1992-09)**

*Indian Standard*

**SPECIFICATION FOR HEADLIGHT  
SWITCHES FOR AUTOMOBILES**

**(Incorporating Amendment No. 1)**

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**BUREAU OF INDIAN STANDARDS**  
**MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG**  
**NEW DELHI 110002**

**Price Group 3**

*Indian Standard***SPECIFICATION FOR HEADLIGHT  
SWITCHES FOR AUTOMOBILES**

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# *Indian Standard*

## SPECIFICATION FOR HEADLIGHT SWITCHES FOR AUTOMOBILES

### 0. FOREWORD

**0.1** This Indian Standard was adopted by the Indian Standards Institution on 10 May 1967, after the draft finalized by the Automobile Electrical Equipment Sectional Committee had been approved by the Electrotechnical Division Council.

**0.2** Work on the formulation of standards for various automobile electrical equipment has been undertaken with a view to establishing acceptable levels of quality and performance as well as bringing about a degree of interchangeability in these units. This is one of a series of Indian Standards on automobile electrical equipment.

**0.3** This standard deals with headlight switches for automobiles both pull-out type and the rotary type which change over current circuit of headlight and various external lights by manual operation.

**0.4** In preparing this standard reference has been made to JIS D 5804-1962 'Head Lighting Switches for Automobiles' published by Japanese Standards Association.

**0.5** This edition 1.1 incorporates Amendment No. 1 (September 1992). Side bar indicates modification of the text as the result of incorporation of the amendment.

**0.6** For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960\*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

### 1. SCOPE

**1.1** This standard covers the basic mechanical and electrical requirements and methods of test for 6, 12 and 24 volt headlight switches both pull-out type and the rotary type, for use in automobiles.

**1.2** This standard does not cover combination type of headlight switches with ignition switches.

### 2. TERMINOLOGY

**2.0** For the purpose of this standard, the following definitions shall apply.

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\*Rules for rounding off numerical values ( *revised* ).

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**2.1 Headlight** — Illuminating light of a vehicle intended to illuminate the road ahead.

**2.2 Sidelight** — A lighting device which emits light indicating the presence of a vehicle when seen from the front and in case of wide vehicles is also intended to show the width.

**2.3 Taillight** — A lighting device which emits red light indicating the presence of the vehicle when seen from the rear and in case of wide vehicles is also intended to show the width.

**2.4 Parking Light** — A lighting device showing a white (uncoloured light) to the front and a red light to the rear to give warning of the presence of the vehicle when parked.

**2.5 Rear Number Plate Light** — A lighting device intended to illuminate the rear number plate.

**2.6 Stop Light** — A brake-operated lighting device which emits red or amber light at the rear of the vehicle intended to give warning of the slowing down or the stopping of the vehicle.

**2.7 Roof Light** — A lighting device intended for the illumination of the interior.

**2.8 Fog Light** — A lighting device enabling the road to be effectively illuminated in fog, snow fall, rain storms or dust clouds.

**2.9 Routine Tests** — Tests carried out on each switch to check requirements which are likely to vary during production.

**2.10 Type Tests** — Tests carried out to prove conformity with the specification. These are intended to prove the general qualities and design of a given type of headlight switch.

## **3. RATED VOLTAGE, LOAD AND TERMINAL MARKINGS**

**3.1** The rated voltage, maximum load, terminal markings and connection side of the switch shall be as shown in Table 1.

## **4. DIMENSIONS**

**4.1** The dimensions of the pull-out type of headlight switches shall be as given in Fig. 1.

**4.2** The dimensions of the rotary type of headlight switches shall be as given in Fig. 2.

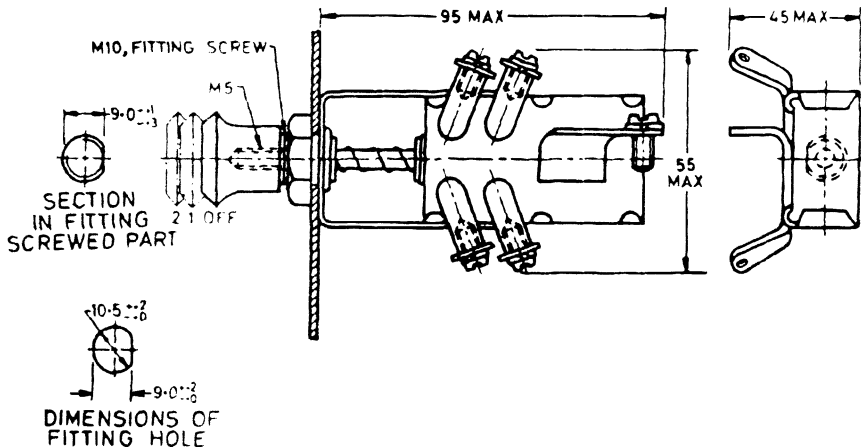
NOTE — The dimensions of headlight switches differ from vehicle to vehicle and an attempt is being made to bring about certain amount of interchangeability in the matter of fixing dimensions. Therefore, comments are specially invited from the vehicle manufacturers regarding this aspect with their own suggestions.



TABLE 1 RATINGS FOR HEADLIGHT SWITCHES

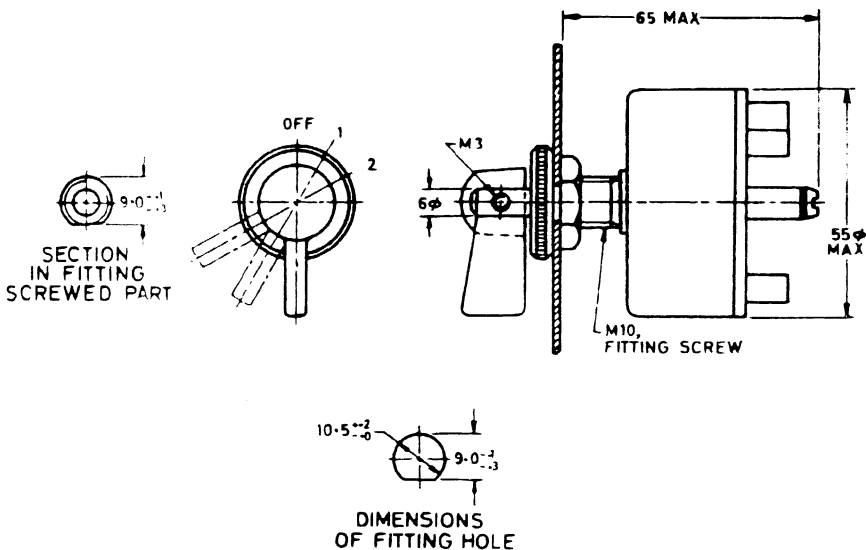
TERMINAL MARKINGS →		B	T	P	H
CONNECTION SIDE →		Storage battery, roof light and stop light	Dash board light, fog Light, tail-light, side-light, rear number plate light	Parking light	Head-light
MAX LOAD FOR RATED VOLTAGE	6 and 12	—	130 W	40 W	160 W
	24	—	160 W	40 W	160 W

NOTE — The terminal marking shall be clearly shown in the position to discriminate each terminal easily.



All dimensions in millimetres.

FIG. 1 PULL-OUT TYPE HEADLIGHT SWITCH



NOTE — The terminal screws shall be M4.

All dimensions in millimetres.

FIG. 2 ROTARY TYPE HEADLIGHT SWITCH

## 5. CHANGEOVER SYSTEM

5.1 The changeover system of the switch shall be as shown in Table 2.

TABLE 2 CHANGEOVER POSITIONS				
TERMINAL MARKINGS →	B	T	P	H
CHANGE OVER POSITION ↓				
OFF	×	—	—	—
1	×	×	×	—
2	×	×	—	×

NOTE — The mark × denotes the conditions of admitting into connecting circuit for each terminal.

## 6. MARKING

**6.1** The headlight switch shall be indelibly marked in a conspicuous place with the following information:

- a) Name of the manufacturer/trade-name, if any;
- b) Rated voltage (marked only to switch for 24 V); and
- c) Country of manufacture.

**6.1.1** The switches may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

## 7. TESTS

### 7.1 Classification of Tests

**7.1.1** The following shall constitute type tests:

- a) Visual examination ( *see 7.2* ),
- b) Test for changeover operation ( *see 7.3* ),
- c) Test for corrosion resistance ( *see 7.4* ),
- d) High voltage (flash) test ( *see 7.5* ),
- e) Insulation resistance test ( *see 7.6* ),
- f) Test for contact resistance drop ( *see 7.7* ),
- g) Endurance test ( *see 7.8* ),
- h) Vibration test ( *see 7.9* ), and
- j) Test for weather-proofness ( *see 7.10* ).

**7.1.2 Acceptance Tests** — The following shall constitute acceptance tests:

- a) Visual examination ( *see 7.2* ),
- b) Test for changeover ( *see 7.3* ),
- c) High voltage (flash) test ( *see 7.5* ),
- d) Insulation resistance test ( *see 7.6* ), and
- e) Test for contact resistance drop ( *see 7.7* ).

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**7.1.3 Routine Tests** — The following shall constitute routine tests:

- a) Visual examination ( *see 7.2* ),
- b) Test for changeover ( *see 7.3* ),
- c) High Voltage (flash) test ( *see 7.5* ), and
- d) Insulation resistance test ( *see 7.6* ).

**7.2 Visual Examination** — The switches shall be examined for finish dimensions and assembly and shall be free from injurious flaws or other defects. The dimensions shall conform to 4.

**7.3 Test for Changeover Operation** — The circuit changeover operation shall be positive and free from abnormalities at the time of lighting.

**7.4 Test for Corrosion Resistance** — The test for corrosion resistance of the headlight switches shall be conducted as specified in Appendix A.

**7.5 High Voltage (Flash) Test** — The switch shall be subjected to a flash test with an ac of 500 V rms at a convenient frequency between 40 and 60 c/s between each of the terminals and the cover. The switch shall satisfactorily withstand this test without arcing or puncture.

**7.6 Insulation Resistance Test** — The insulation resistance between the insulated terminals and between the terminal and metallic main body when measured with a dc voltage of 500 V at the prevailing atmospheric temperature and humidity shall be not less than 1 megohm.

**7.7 Test for Contact Resistance Drop** — When the load indicated in Table 1 is applied between the power terminal and each terminal, the voltage drop due to contact resistance shall be not more than 0.24 V.

NOTE — The values for contact resistance drop and insulation resistance are the values to be observed after the endurance test. However, the initial values for these tests when conducted as routine tests will be much more. The initial values when these tests are conducted as routine tests are under consideration.

**7.8 Endurance Test** — The test piece shall be suitably mounted and operated for 30 000 times with a connected load equal to 120 percent of the maximum load specified in Table 1 at a test terminal voltage of 14 V for switches intended for operation at 6 V and 12 V, or at 28 V for switches intended for operation at a rated voltage of 24 V. The flickering operation shall be at the rate of 25 to 30 times per minute. The connected test load shall be in the form of a suitable lamp. The switch after being subjected to this test shall be allowed to come down to room temperature and then tested for insulation resistance, contact voltage drop and changeover operation ( *see 7.6, 7.7 and 7.3* ).

**7.9 Vibration Test** — The switch with the mounting after being rigidly mounted on a suitable vibrating machine constructed to produce a simple harmonic motion, shall be subjected to vibrate (a total lift of 1.5 mm) through a frequency range of 10-55-10 c/s in a period of

one minute. With continuously varying frequencies, the vibration shall be applied for not less than one hour in each of the 3 major axes of the switch. At the end of the vibration test the switch shall be examined for any evidence of damage and pass insulation resistance test, test for contact resistance drop and test for changeover operation.

**7.10 Test for Weather-Proofness** — The switch shall be fitted in normal working conditions, sprayed with water from above at a rate of 3-times a day (one hour each time) by a sprinkler, and subject it to this test for 10 continuous days. At the end of the test there shall be no rust formation, fall in insulation resistance, increase in contact resistance and other abnormalities in operating conditions.

NOTE — This is an optional test and is to be required only when the switches are intended to be exposed directly to open air conditions in actual usage.

## **A P P E N D I X   A**

( *Clause 7.4* )

### **TEST FOR CORROSION RESISTANCE**

#### **A-1. PROCEDURE**

**A-1.0** The ability of the switch with its cover and terminal compartments in position, to withstand corrosion due to atmospheric conditions, shall be assessed by the following test.

**A-1.1** The chamber for this test shall be so constructed that the salt spray is produced in the lower part of the chamber, in the upper part of which the parts to be exposed are suspended.

**A-1.2** The spray shall be produced by an atomiser employing compressed air free from all impurities.

**A-1.3** The ceiling, the walls and all other parts of the chamber shall be so constructed and the parts under test so arranged that no condensate can drip on the test specimen.

**A-1.4** The salt solution shall be a 5 percent solution of sodium chloride in water.

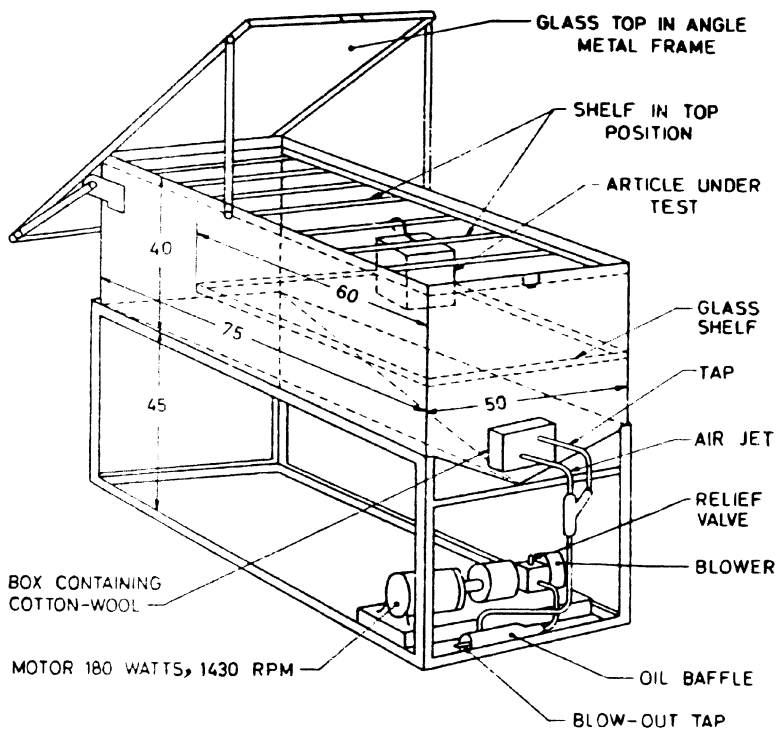
**A-1.5** The device shall be sprayed in such a chamber at the standard temperature 27°C, for a cycle of 50 hours consisting of two periods of 24 hours each and one hour draining periods.

**A-1.6** After removal from the salt spray chamber, the parts shall not show any sign of corrosion or electrolytic action which will adversely affect the functioning of any part of the device.

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**A-1.7** In general, a salt spray chamber as described below would be suitable. Details of such chamber and the spraying mechanism are shown in Fig. 3 and 4 respectively:

- a) The cabinet should approximately be of the dimensions shown, and the cabinet and its internal fittings should be made of monel metal or other suitable material. A shelf is required, which should be capable of being fitted in the upper or lower part of the cabinet;
- b) The air used for atomizing the salt solution shall be clean. The pressure during the tests shall be between  $0.29$  and  $0.35 \text{ kg/cm}^2$ . The pressure may be adjusted by a relief valve or by the pressure outlet of the blower;



All dimensions in centimetres.

**FIG. 3 SALT SPRAY CHAMBER**

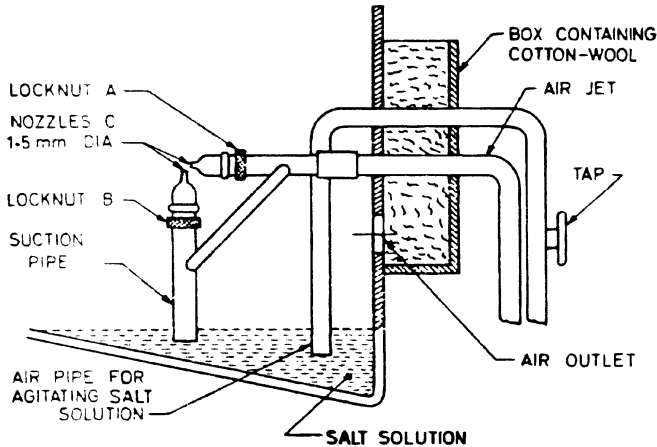


FIG. 4 DETAILS OF SPRAYING ARRANGEMENT

- c) The nozzle for atomizing the salt solution shall be adjusted for maximum amount of spray. This adjustment may be carried out by unscrewing the bottom lock nut *B*, on the lower nozzle *C*, and adjusting this nozzle into position until maximum spray occurs. The diameter of the nozzles shall be 1.5 mm. A tap and second branch in the air line is available for agitating the salt solution as required;
- d) The spraying apparatus shall be capable of atomizing not less than 1 450 ml salt solution per hour. The quantity of solution sprayed per cubic metre capacity of the test of chamber shall be approximately 177 ml per minute; and
- e) The container filled with cotton wool acts as a breather and provides an outlet for the air which is constantly being pumped into the chamber, the cotton wool acting as a filter and preventing salt mist from being discharged into the atmosphere.

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### Amendments Issued Since Publication

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## BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002.  
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha  
(Common to all offices)

Regional Offices:

Telephone

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg  
NEW DELHI 110002

{ 323 76 17  
323 38 41

Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Kankurgachi  
KOLKATA 700054

{ 337 84 99, 337 85 61  
337 86 26, 337 91 20

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022

{ 60 38 43  
60 20 25

Southern : C. I. T. Campus, IV Cross Road, CHENNAI 600113

{ 235 02 16, 235 04 42  
235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)  
MUMBAI 400093

{ 832 92 95, 832 78 58  
832 78 91, 832 78 92

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